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Title : Magnitude and sources of variability in Steller sea lion (*Eumetopias jubatus*) prey quality.

Category : Ecology

Student : M.A./M.S.

Preferred Format : Either Oral or Poster Presentation

Abstract :

Population declines of piscivorous predators across multiple taxa in the North Pacific Ocean and Bering Sea during the latter half of this century have led to the investigation of nutritional stress as a primary cause. Assessment of the nutritional stress hypothesis through bioenergetic modeling which is particularly sensitive to prey quality inputs, requires detailed information regarding the magnitude and sources of variability of prey body composition. Proximate composition and energy density of several important Steller sea lion (*Eumetopias jubatus*) prey species, including walleye pollock (*Theragra chalcogramma*), Pacific herring (*Clupea harengus*), eulachon (*Thaleichthys pacificus*), capelin (*Mallotus villosus*) and Pacific hake (*Merluccius productus*) were evaluated through a systematic experimental design. For a given species of fish, proximate composition varied significantly, particularly lipid content which varied by an average of 35-fold among individuals within a species, with over 100-fold differences among individual mature pollock. Seasonal effects primarily accounted for variability within species. A general cyclical trend of body composition was observed, with increasing lipid stores (and consequentially energy density) throughout the summer coincident with intense feeding activity, peaking in the fall or winter, and subsequently declining in the spring due to scarce food supplies, migration patterns and energetic demands for spawning. Shifts in peak condition among species caused the relative ranking of prey to alternate depending upon season, with no one species remaining a superior source of lipid or energy content. Other factors such as gender, location, and size had minimal effect on body composition. The relatively large fluctuations in proximate composition have important ramifications for piscivorous predators, which may experience relatively large differences in nutrient content of a single species depending on the time of year they are consumed.